

HAWAII ADMINISTRATIVE RULES

TITLE 12 DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS

SUBTITLE 8

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH

CHAPTER 236

VERTICAL WHEELCHAIR LIFTS

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**§12-236-1 Definitions.** As used in this chapter:

"Safety" means a mechanical device attached to the car frame or to the counterweight, when provided, to stop and hold the car or counterweight in case of predetermined overspeed or free fall, or if the suspension ropes slacken.

"Vertical wheelchair lift" means a power passenger lift used to vertically raise and lower a person in a wheelchair or a person of limited mobility in or on a car or platform from one level to another. [Eff. 7/12/82; am 12/8/86; am and comp 12/6/90] (Auth: HRS §397-3) (Imp: HRS §397-3)

**§12-236-2 General requirements.** (a) This chapter applies to vertical wheelchair lifts installed in or at a public building for use by persons with disabilities.

(b) All new and existing installations of vertical wheelchair lifts shall be reasonably safe for their designed use. Compliance with the rules of this chapter, chapter 12-230, ASME A17.1, and NFPA 70 where applicable shall be prima facie evidence that the requirements have been met.

(c) Conformity of all new installations of elevators, dumbwaiters, escalators, and moving walks with the applicable codes set forth in ASME A17.1, NFPA 70, the Uniform Building Code, equivalent standards acceptable to the department, or the provisions of this chapter shall be prima facie evidence that these installations are reasonably safe to persons and property. Existing installations shall comply with the edition of the ASME A17.1 codes in effect at the time of installation, unless modified in this chapter.

(d) Conditions found not in conformance with applicable requirements, which the owner, user, or contractor could not reasonably have been aware of, shall be regarded as discrepancies. All discrepancies shall be satisfactorily resolved as soon as possible. When, in the opinion of the department, a discrepancy constitutes a potentially serious or imminent hazard, it shall make an order to abate the condition within an appropriate time and may prohibit the use of the equipment until the condition is abated. Failure to correct discrepancies or failure to abate an unsafe condition within the time specified shall be deemed to be a violation. [Eff. 7/12/82; am and comp 12/6/90; am 11/5/93] (Auth: HRS §397-4) (Imp: HRS §397-4)

**§12-236-3 Alternate methods of installation enclosures.** Vertical wheelchair lifts shall be installed in enclosures according to either section 12-236-4 or section 12-236-5 if installed in an area accessible to the public. [Eff. 7/12/82; comp 12/6/90; am 11/5/93] (Auth: HRS §397-4) (Imp: HRS §397-4)

**§12-236-4 Hoistway enclosure provided.** (a) The hoistway shall be guarded by a solid enclosure extending from the lower landing to a height of at least 42 inches (105 cm) above the upper landing. The lift sides of the enclosure shall present a smooth surface.

(b) The hoistway entrance shall be guarded at the upper level by a metal door of unperforated construction. The door shall be self-closing and at least 42 inches (105 cm) in height and be provided with a combination mechanical lock and electrical contact. The door may only be opened if the platform is within 2 inches (5 cm) of that level. It may permit the platform to move away from the landing under control of the normal operating device if the door is in the closed position but not locked provided that the device will cause the platform to stop if the door fails to lock before the platform has moved away from the landing more than 2 inches (5 cm). The hoistway side of the door shall present a smooth surface.

(c) The lower access to the platform shall be guarded by an unperforated metal self-closing door not wider than the entrance to the platform. The opening shall provide a minimum vertical clearance of 6 feet 8 inches (2.02 m). The door shall provide with a combination mechanical lock and electrical contact. The door may only be opened if the platform is within 2 inches (5 cm) of the landing. The platform may be moved away from the landing under control of the normal operating device if the door is closed but not locked, provided that the combination mechanical lock and contact causes the platform to stop if the platform moves away from the landing 2 inches (5 cm) before the door is locked. The hoistway side of the door shall present a smooth surface.

(d) The platform side of the landing doors shall not project beyond the vertical line of travel of the platform. No hardware, except that required for door locking or contacts, shall project beyond the vertical line of travel of the platform.

(e) The running clearance between the platform and any enclosure shall be not less than 3/8 inch (0.9 cm) or more than 3/4 inch (1.9 cm). The clearance between the platform and doors shall not exceed 3 inches (7.5 cm).

(f) The platform side guards on the sides not used for access or exit

shall be of smooth construction with no openings other than those necessary for operation to a height of 42 inches (105 cm) above the platform or car floor. Those openings necessary for operation shall reject a ball 1/2 inch (1.2 cm) in diameter. A grab rail extending the full length of the side guards shall be provided at a height of 36 inches (90 cm). The running clearance between the side guards and the enclosure shall be not less than 2 inches (5 cm) nor more than 3 inches (7.5 cm). [Eff. 7/12/82; am and comp 12/6/90] (Auth: HRS §397-4) (Imp: HRS §397-4)

**§12-236-5 Hoistway enclosure not provided.** (a) The underside of the platform shall be guarded by a smooth metal toe guard on all accessible sides. The depth of the toe guard shall be at least equal to the maximum upward travel of the platform from the lower landing plus 3 inches (7.5 cm). The toe guard shall withstand, without permanent deformation, a force of 125 pounds (56.8 kg) applied at any point on an area of 4 inches (10 cm) by 4 inches (10 cm).

(b) The hoistway entrance shall be protected at the upper level by a metal door of unperforated construction. The door shall be self-closing, at least 42 inches (105 cm) in height and be provided with a combination mechanical lock and electrical contact. The door may only be opened if the platform is within 2 inches (5 cm) of the upper landing. It may permit the movement of the platform away from the landing under control of the normal operating device if the door is in the closed position but not locked, provided that the device will cause the platform to stop if the door fails to lock before the platform has moved away from the landing more than 2 inches (5 cm). The hoistway side of the door shall present a smooth surface.

(c) The side of the platform providing access to the lower landing shall be guarded by a metal door of unperforated construction. The door shall be self-closing, at least 42 inches (105 cm) in height, and be provided with a combination mechanical lock and electrical contact. The door may be opened if the platform is within 2 inches (5 cm) of the lower level. It may permit the platform to move away from the lower landing if the door is in the closed position but not locked, provided that the device will cause the platform to stop if the door fails to lock before the platform has moved away from the landing more than 2 inches (5 cm).

(d) The door at the upper access landing shall be located not more than 3 inches (7.5 cm) from the platform sill.

(e) The platform side of the landing doors shall not project beyond the vertical line of travel of the platform. No hardware, except that required for door locking or contacts, shall project beyond the vertical line of travel of the platform.

(f) A smooth metal face plate of solid construction not less than No. 16 U.S. Gauge shall be fastened securely from the lower landing to the upper landing sill to protect the full width of the platform.

(g) The platform side guards on the sides not used for access or exit shall be of smooth construction with no openings other than those necessary for operation to a height of 42 inches (105 cm) above the platform or car floor. These openings necessary for operation shall reject a ball 1/2 inch (1.2 cm) in diameter. A grab rail extending the full length of the side guards shall be provided at a height of 36 inches (90 cm). The running clearance between the side guards and the enclosure shall be not less than 2 inches (5 cm) or more than 3 inches (7.5 cm). [Eff. 7/12/82; am and

**§12-236-6 Pipes in platform vicinity.** Pipes conveying steam, gas or liquids which, if discharged into the runway of the platform, would endanger life or health shall not be permitted. [Eff. 7/12/82; comp 12/6/90] (Auth: HRS §397-4) (Imp: HRS §397-4)

**§12-236-7 Cars. (a) Car construction.**

- (1) Car frame and platform. The car frame shall be of metal construction and have a safety factor of not less than 5 based on rated load. The platform shall be of metal or wood construction with a non-skid surface.
- (2) Use of cast iron. Cast iron shall not be used in the construction of any member of the car frame or platform other than for guide shoes and guide shoe brackets.
- (3) Platform size. The net platform area shall not exceed 12 square feet (3.6 m<sup>2</sup>).

(b) Car illumination. The minimum illumination at the landing edge of the platform with the landing door open shall be not less than 5 footcandles.

(c) Platform safeties and governors. All vertical wheelchair lifts shall be provided with a platform safety. The safety may be of the inertia type or operated by a speed governor. If operated by a speed governor, the governor tripping speed shall not exceed 75 feet (22.7 m) per minute. The safety may be of the type A design. Safeties are not required if the driving machine is of the direct plunger hydraulic type.

(d) Application of safeties. The application of any safety specified in this section shall conform to rule 205.9a, b, c and d in ASME A17.1, and shall be so designed that the forces which provide the stopping action shall not generate a separating force on the guide rails.

(e) Materials used in safeties. Parts of safeties, except springs, shall have a safe factor of not less than 3-1/2 and the materials used shall have an elongation of not less than 15 per cent in a length of 2 inches (5 cm). Forged, cast, or welded parts shall be stress relieved.

(f) Lower level access ramp. When the installation does not include a pit, a ramp shall be provided at an incline no greater than 1 inch (2.5 cm) in 12 inches (30 cm). The ramp shall be mounted on the lower landing and shall be provided with a non-skid surface.

(g) Location of speed governor. Where a speed governor is used, it shall be located where it is readily accessible outside the hoistway and it cannot be struck by any moving object in normal operation or under conditions of over-travel and where there is sufficient space for full movement of the governor parts.

(h) Opening of the brake circuit on safety application. Where a speed governor is used, the motor circuit and the brake circuit shall be opened before or at the time that the safety applies.

(i) Governor ropes. The governor ropes shall be of iron, steel, monel metal or phosphor bronze not less than 1/4 inch (0.6 cm) in diameter. Tiller rope construction shall not be used. [Eff. 7/12/82; am and comp 12/6/90; am 7/6/98] (Auth: HRS §397-4) (Imp: HRS §397-4)

**§12-236-8 Guide rails. (a) Material.** Platform guide rails shall be

of metal construction. Steel construction shall conform to the requirements of Rule 200.2a ASME A17.1. Metals other than steel shall conform to the requirements of Rule 200.2b ASME A17.1.

(b) Extension of guide rails. The top and bottom ends of each run of guide rail shall be so located in relation to the extreme positions of travel of the car that the car guiding members cannot travel beyond the ends of the guide rails.

(c) Guiding mechanism enclosures. The guiding mechanism shall be enclosed with a solid enclosure to prevent accidental contact. If openings are necessary in this enclosure for operation, they shall reject a ball 3/4 inch (1.9 cm) in diameter.

(d) Fastenings, deflections, and joints. Fastenings, deflections, and joints shall conform to the requirements set forth in Rule 501.1b in ASME 17.1.

(e) Machine framework and base.

(1) All machine frames shall be of metal construction and have a safety factor of not less than 5 based on the rated load. Cast iron shall not be used.

(2) The machine framework and base shall be secured in place with adequate support provided to maintain the device in a level position. [Eff. 7/12/82; am and comp 12/6/90; am 7/6/98] (Auth: HRS §397-4) (Imp: HRS §397-4)

**§12-236-9 Machinery beams and supports.** (a) Securing of machinery beams of type of supports. All machinery and sheaves shall be so supported and secured as to effectually prevent any part becoming loose or displaced. Beams directly supporting machinery shall be of steel or reinforced concrete.

(b) Loads on overhead beams and supports. Loads on overhead beams and their supports shall be computed as follows:

- (1) The total load on overhead beams shall be assumed as equal to the weight of all apparatus resting on the beams plus twice maximum load suspended from the beams;
- (2) The load resting on the beams shall include the complete weights of the driving machine, sheaves, and controller;
- (3) The load suspended from the beams shall include the sum of the tensions in all ropes suspended from the beams. Note: The object in doubling the suspended load is to allow for impact, acceleration, and other stresses.

(c) Factor of safety of overhead beams and their supports. The elevator driving machine or sheaves shall not be fastened to the underside of the supporting beams at the top of the hoistway. Exception: Idlers or deflecting sheaves with their guards and frames. Cast iron in tension shall not be used for supporting members for sheaves where they are hung beneath beams.

(d) Driving means. The driving means may be a winding drum, chain drive, screw drive, rack and pinion drive, direct plunger, rope, or lever. [Eff. 7/12/82; comp 12/6/90] (Auth: HRS §397-4) (Imp: HRS §397-4)

**§12-236-10 Driving machines and sheaves.** (a) Materials and minimum drum diameters. Winding drums and overhead and deflecting sheaves shall be of cast iron or steel, of a diameter not less than 30 times the diameter of the hoisting ropes, except that where 8 x 19 steel ropes or 7 x 19 aircraft cable

are used, the diameter of drums and sheaves may be reduced to 21 times the diameter of the rope or cable. The rope grooves shall be machined.

(b) Safety factor. The safety factor based on the static load (the rated load plus the weight of the car, ropes, counterweights, etc.) to be used in the design of driving machines and sheaves, shall be not less than eight for wrought iron and steel, and not less than 10 for cast iron, cast steel, and other materials.

(c) Set screw fastenings. Set screw fastenings shall not be used instead of keys or pins if the connection is subject to torque or tension.

(d) Friction-gearing, clutch mechanism, or coupling. Friction gearing, clutch mechanisms, or couplings shall not be used in connecting the drum or sheaves to the main driving gear.

(e) Use of cast iron in gears. Worm gearing having cast iron teeth shall not be used.

(f) Driving machine roller chains and sprockets.

(1) Driving machine chains and sprockets shall be of steel and shall conform in all particular of design and dimensions to ANSI B29.1, Transmission Roller Chains and Sprockets.

(2) If two or more chains are used as a suspension means and a worn chain or sprocket is replaced, all chains and sprockets must be replaced.

(g) Arc of contact of suspension means on sheaves and sprockets. The arc of contact of a wire rope on a traction sheave shall be sufficient to produce adequate traction under all load conditions. The arc of contact of a chain with a driving sprocket shall not be less than 140 degrees.

(h) Driving machine brakes. Driving machines shall be equipped with electrically-released, mechanically-applied brakes.

(i) Operation of brake. A single ground or short circuit, a counter-voltage or a motor-field discharge shall not prevent the brake magnet from allowing the brake to set when the operating device is placed in the stop position.

(j) Guard and protection of driving machines and suspension means.

(1) The drive machine and suspension means shall be enclosed with a solid enclosure. Any opening required for operation shall reject a ball 3/4 inch (1.9 cm) in diameter.

(2) Access shall be provided by a removable panel for the purposes of inspection and service. [Eff. 7/12/82; am and comp 12/6/90]

(Auth: HRS §397-4) (Imp: HRS §397-4)

**§12-236-11 Terminal stopping devices.** (a) Stopping devices. Upper and lower terminal stopping devices operated by the car shall be provided and shall be set to stop the car at or near the upper and lower terminal landings. Upper and lower final terminal stopping devices operated by the car shall be provided which will remove power from the motor brake.

(b) Operation of stopping devices. The final terminal stopping device shall act to prevent movement of the platform in both directions of travel. The normal and final terminal stopping devices shall not control the same switches on the controller unless two or more separate and independent switches are provided, two of which shall be closed to complete the motor and brake circuit in each direction of travel.

(c) Assurance of motor reversal. A protective circuit or device shall be provided where a non-instantly reversible motor is used that will prevent

the motor from continuing in the same direction if the reversing control is activated. [Eff. 7/12/82; comp 12/6/90] (Auth: HRS §397-4) (Imp: HRS §397-4)

**§12-236-12 Operating device. (a)** Types of operation. Operation of the platform from the upper or lower landings and on the platform shall be controlled by a key. The key operated control shall be operated by a lock having pins with the key removable only from the "off" position. A key switch shall be provided at each station which will allow a control switch at that station to become effective only when the key is in the "on" position. "Up" and "down" control switches at all stations shall be by means of a constant pressure device. Note: Due to the possible handicap of the passengers, a spring-loaded, self-returning key operating switch is not desirable.

**(b)** Control and operating circuit requirements. The design and installation of the control and operating circuits shall conform to the following:

- (1) Control systems which depend on the completion or maintenance of an electric circuit shall not be used for the interruption of the power and application of the machine brake at terminals or for stopping the machine when the safety applies;
- (2) If springs are used to actuate switches, contractors, or relays to break the circuit to stop a car at the terminal, they shall be of the restrained compression type; and
- (3) The failure of any single magnetically-operated switch, relay, or contactor, to release in the intended manner or the occurrence of a single accidental ground shall not permit the car to start if the hoistway door or platform door or gate is not in the closed position. It shall not permit the platform to move more than 2 inches (5 cm) away from a floor with the entrance door unlocked.

**(c)** Wiring methods in hoistways and machinery spaces. The installation of all electrical wiring in hoistways and machinery spaces except as may be provided elsewhere in this chapter shall conform to the requirements of NFPA 70 Section 620.

**(d)** Phase reversal and failure protection. If polyphase power supply is used, a reverse phase protection shall be provided in accordance with Rule 210.6, ASME A17.1.

**(e)** Emergency stop switch. A stop switch conforming to Rule 210.2e, ASME A17.1, shall be provided on every platform.

**(f)** Slack-rope and slack-chain devices for winding-drum and roller-chain type driving machines.

- (1) Winding drum machines with rope suspension shall be provided with a slack rope device of the manually reset type that will remove power from the motor and brake if the car is obstructed in its descent and the hoisting ropes slacken.
- (2) Elevators with roller chain suspension shall be provided with a slack chain device which will remove power from the motor and brake if the car is obstructed in its descent and the suspension means slacken. This device need not be of the manually reset type if the chain sprockets are guarded to prevent the chain from becoming disengaged from the sprockets.

**(g)** Emergency signals. If a vertical wheelchair lift is installed in an area not visible to persons at all times, an emergency signal shall be installed. The emergency signal shall consist of a telephone connected to a

central telephone exchange and an audible signal operated from the platform shall be provided.

(h) Limitation of load, speed, and rise. The rated load shall not be less than 450 pounds (204.5 kg) nor more than 750 pounds (340 kg). The rated speed shall not exceed 30 feet (9.1 m) per minute. The rise shall not exceed 12 feet (3658 mm).

(i) Data plates. A data plate shall be provided by the manufacturer and fastened in a conspicuous place stating the speed, suspension means, capacity, manufacturer's name, and date of manufacture. The letters and numerals used shall not be less than 1/4 inch (0.6 cm) in height.  
[Eff. 7/12/82; am and comp 12/6/90; am 11/5/93] (Auth: HRS §397-4) (Imp: HRS §397-4)

**§12-236-13 Suspension and driving means. (a) Types permitted.** Suspension and driving means shall be any one of the following: Steel or iron elevator wire rope, steel aircraft cable, roller chain, direct plunger hydraulic, roped hydraulic, rack and pinion, or screw drive. Where wire rope, aircraft cable or roller chain is used, suspension means shall be not less than 2 of the means used.

(b) Types prohibited. Steel tapes or welded link chains shall not be used as suspension means.

(c) Factors of safety of suspension means. The suspension means shall have a safety factor of not less than 7 based on the tension in the rope, cable, chain, or forces exerted on the hydraulic cylinder, screw drive, or the rack and pinion when raising the rated load. When the car and counterweight are suspended by steel ropes and the driving means between the machine and the counterweight is an endless roller-type chain, the factor of safety of such chain with rated load on the platform shall not be less than 8.  
[Eff. 7/12/82; comp 12/6/90] (Auth: HRS §397-4) (Imp: HRS §397-4)